

CLAIMS

We claim:

- 1 1. A disambiguation method in a spoken dialog service that identifies a user need,
2 the disambiguation method being associated with a rooted tree, the method comprising:
 - 3 (a) based on a received user utterance in response to a prompt, establishing
4 at least one lit node and assigning a current focus node;
 - 5 (b) if there is a single direct descendent of the focus node that is lit:
 - 6 (1) assigning the lit direct descendent of the current focus node as a
7 new focus node;
 - 8 (2) if the new focus node is a leaf node, identifying the user need; and
 - 9 (3) if the new focus node is not a leaf node, prompting the user to
10 disambiguate between descendent nodes of the new focus node and returning to step (a);
 - 11 (c) if there is not a single direct descendent of the current focus node that is
12 lit:
 - 13 (1) assigning a lowest common ancestor node of all lit nodes as a new
14 focus node;
 - 15 (2) prompting the user for input to disambiguate between descendent
16 nodes of the new focus node; and
 - 17 (3) returning to step (a).
- 1 2. The method of claim 1, wherein if after step (a), only one lit node exists that is
2 not a direct descendent of the focus node, and the one lit node is a leaf node, the method
3 further comprises:
 - 4 (d) identifying the user need according to the lit leaf node.

1 3. The method of claim 2, wherein if only one lit node exists that is not a direct
2 descendent of the focus node and the one lit node is a leaf node, the method further
3 comprises presenting information to the user regarding a condition of the lit leaf node.

1 4. The method of claim 1, wherein a first prompt to the user is associated with a
2 root node of a rooted tree.

1 5. A dialog manager within a spoken dialog service, the dialog manager operating
2 according to a dialog disambiguation rooted tree, the rooted tree having a root node,
3 nodes descending from the root nodes organized in categories and leaf nodes, the dialog
4 manager performing the steps:

5 (a) gathering input from a user to match with at least one node and node
6 condition, wherein a first prompt from the dialog manager relates to a focus root node;
7 (b) lighting at least one relevant node according to the received user input;
8 (c) generalizing by attempting to select a new focus node further from a
9 current focus node by:

10 (1) assigning a node as a new focus node if it is the only lit direct
11 descendent of a focus node after step (b); and
12 (2) assigning a lowest common ancestor node as a new focus node if
13 there are multiple descendent nodes that are lit and step (c)(1) does not apply.

1 6. The dialog manager of claim 5, wherein step (c)(1) further comprises:
2 if the new focus node is a leaf node, identifying the user need; and
3 if the new focus nodes is not a leaf node, prompting the user to disambiguate
4 between descendent nodes of the new focus node and returning to step (b).

1 7. The dialog manager of claim 6, wherein step (c)(2) further comprises:

2 prompting the user for input to disambiguate between descendent nodes of the
3 new focus node; and
4 returning to step (b).

1 8. The dialog manager of claim 5, wherein if after step (b), only one lit node exists
2 that is not a direct descendent of the focus node, and the one lit node is a leaf node, the
3 method further comprises:
4 identifying the user need according to the lit leaf node.

1 9. The dialog manager of claim 8, wherein if only one lit node exists that is not a
2 direct descendent of the focus node and the one lit node is a leaf node, the method
3 further comprises presenting information to the user regarding a condition of the lit leaf
4 node.

1 10. A method within a spoken dialog service for controlling a dialog flow using a
2 dialog disambiguation rooted tree, the rooted tree having a root node, nodes descending
3 from the root nodes organized in categories and leaf nodes, the method comprising:
4 (a) gathering input from a user to match with at least one node and node
5 condition, wherein a first prompt from the dialog manager relates to a focus root node;
6 (b) lighting at least one relevant node according to the received user input;
7 (c) generalizing by attempting to select a new focus node further from a
8 current focus node by:
9 (1) assigning a node as a new focus node if it is the only lit direct
10 descendent of a focus node after step (b); and
11 (2) assigning a lowest common ancestor node as a new focus node if
12 there are multiple descendent nodes that are lit and step (c)(1) does not apply.

1 11. The method of claim 10, wherein step (c)(1) further comprises:

2 if the new focus node is a leaf node, identifying the user need; and
3 if the new focus node is not a leaf node, prompting the user to disambiguate
4 between descendent nodes of the new focus node and returning to step (b).

1 12. The method of claim 10, wherein if after step (b), only one lit node exists that is
2 not a direct descendent of the focus node, and the one lit node is a leaf node, the method
3 further comprises:
4 identifying the user need according to the lit leaf node.

1 13. The method of claim 12, wherein if only one lit node exists that is not a direct
2 descendent of the focus node and the one lit node is a leaf node, the method further
3 comprises presenting information to the user regarding a condition of the lit leaf node.

1 14. A spoken dialog service utilizing a disambiguation method associated with a
2 rooted tree, the disambiguation method:
3 (a) based on a received user utterance in response to a prompt, establishing
4 at least one lit node and assigning a current focus node;
5 (b) if there is a single direct descendent of the focus node that is lit:
6 (1) assigning the lit direct descendent of the current focus node as a
7 new focus node;
8 (2) if the new focus node is a leaf node, identifying the user need; and
9 (3) if the new focus node is not a leaf node, prompting the user to
10 disambiguate between descendent nodes of the new focus node and returning to step (a);
11 (c) if there is not a single direct descendent of the current focus node that is
12 lit:
13 (1) assigning a lowest common ancestor node of all lit nodes as a new
14 focus node;

- 15 (2) prompting the user for input to disambiguate between descendent
16 nodes of the new focus node; and
17 (3) returning to step (a).

1 15. The spoken dialog service of claim 14, wherein if after step (a), only one lit node
2 exists that is not a direct descendent of the focus node, and the one lit node is a leaf
3 node, the method further comprises:
4 (d) identifying the user need according to the lit leaf node.

1 16. The spoken dialog service of claim 15, wherein if only one lit node exists that is
2 not a direct descendent of the focus node and the one lit node is a leaf node, the method
3 further comprises presenting information to the user regarding a condition of the lit leaf
4 node.

1 17. The spoken dialog service of claim 15, wherein a first prompt to the user is
2 associated with a root node of a rooted tree.

1 18. A computer-readable medium storing computer readable instructions for
2 instructing a computing device to perform a disambiguation method in a spoken dialog
3 service that identifies user need, the disambiguation method being associated with a
4 rooted tree, the method comprising:

- 5 (a) based on a received user utterance in response to a prompt, establishing
6 at least one lit node and assigning a current focus node;
7 (b) if there is a single direct descendent of the focus node that is lit:
8 (1) assigning the lit direct descendent of the current focus node as a
9 new focus node;
10 (2) if the new focus node is a leaf node, identifying the user need; and

11 (3) if the new focus node is not a leaf node, prompting the user to
12 disambiguate between descendent nodes of the new focus node and returning to step (a);
13 (c) if there is not a single direct descendent of the current focus node that is
14 lit:
15 (1) assigning a lowest common ancestor node of all lit nodes as a new
16 focus node;
17 (2) prompting the user for input to disambiguate between descendent
18 nodes of the new focus node; and
19 (3) returning to step (a).

1 19. The computer-readable medium of claim 18, wherein if after step (a), only one lit
2 node exists that is not a direct descendent of the focus node, and the one lit node is a leaf
3 node, the method further comprises:

4 (d) identifying the user need according to the lit leaf node.

1 20. The computer-readable medium of claim 19, wherein if only one lit node exists
2 that is not a direct descendent of the focus node and the one lit node is a leaf node, the
3 method further comprises presenting information to the user regarding a condition of
4 the lit leaf node.

1 21. The computer-readable medium of claim 18, wherein a first prompt to the user is
2 associated with a root node of the rooted tree.